

based on the study of Hydra and Obelia, with a concluding chapter on classification. The book is novel in conception, accurate, up-to-date, and thoroughly artistic in execution. Bütschli on the "Schaumplasma," Boveri on the Ascaris egg, Maupas on the Ciliata, Keuten on Euglena, Hertwig on Actinosphaerium, the mitotic processes in Amœba bi-nucleata, the immortality of the Protozoa, are conspicuous among topics of the times handled in a manner well calculated to arouse the imaginative faculty, which, under our prevailing systems of elementary biological training, is apt to be ignored. Unlike many of its predecessors and contemporaries, the book is written in choice English. It is in places even racy; and in such paragraphs as those in which the author unfolds the points of dissimilarity between Vertebrate and Invertebrate (dog, fish, and lobster), a perspicuity is noticeable equal to that of a good French writer at his best. It recalls most nearly the irresistible charm of the late M. Paul Bert's "Première Année d'Enseignement Scientifique."

The illustrations, fifty-three in number, are mostly original and altogether admirable, and those of the Hydra, based on the author's unpublished researches, will unquestionably become popular—that of the median longitudinal section of this animal being the best we know. On p. 47 the author gives two new figures of the frog's heart, which, as regards the detailed structure of the pylangium and the ostia of the carotid and pulmonary arteries, are wholly unconventional. It is explained in the preface that these are drawings of reconstructive models from sections, and we dare not doubt their accuracy. The question, however, arises how far the facts they reveal may be true of but one individual; and the author would have done well to have either intimated this or left the matter aside till further investigated. Again, we regret the too forced introduction of analogy to the inanimate, as, for example, of the nervous system to the telegraphic apparatus. In this, however, the author is but acting in the spirit of the times. His book is simply charming and well worthy his reputation; and while its literary style should alone ensure for it a wide circulation, it cannot fail to exercise a leavening and humanising influence on the youthful mind. It is to be followed by a second volume, dealing with the Cœlomate Metazoa, and the sooner this appears the better for biological science and culture.

OUR BOOK SHELF.

The Ore Deposits of the United States and Canada. By J. F. Kemp. Pp. xxiv + 462; index and 163 illustrations. Third edition. (New York and London: The Scientific Publishing Company, 1900.)

OF Prof. Kemp's industry as a compiler there can be no question. The last edition of his work on ore deposits is teeming with information, and his footnotes alone are a proof of the thoroughness with which he has conducted his search after facts. But it is not a book which appeals to the elementary student, because he is launched into a mass of details without sufficient preparation in the introductory part, which is sadly lacking in woodcuts. And further, there is evidence of haste or want of care in correcting the book for the press. Surely a writer on ore deposits should be able to spell such names as "Pošepny," "Sjögren" and "Přibram" with strict accuracy. Errors in spelling ordinary French and German words are frequent, and when one notes as many

as nine mistakes in seven consecutive lines, there are fair grounds for complaint. It is not only in his spelling that Prof. Kemp evinces carelessness. A mineralogist would not speak of specular iron as "specular hematite"; the product of a zinc mine should not be called *spelter*, as the word denotes the metal, not the ore. By one of his sentences, one might infer that Prof. Kemp would not admit sulphide of sodium among the metallic sulphides. It is not good English to say: "*Considerable* limonite has also resulted from the weathering of clay-ironstone nodules."

In spite of frequent and unpardonable minor blemishes, which could easily have been avoided by employing a careful proof-reader, the book will be found very useful by those who require a summary of the innumerable memoirs and papers describing American ore deposits.

Prof. Kemp's conclusion that an amendment is needed of the laws regulating the tenure of ore deposits in the Western States will be warmly endorsed by most mining men.

C. L. N. F.

Physiology for the Laboratory. By Bertha Millard Brown, S.B. Pp. viii + 167. (Boston: Ginn and Co., 1900.)

THIS little book sets forth, in twenty-two brief chapters, certain practical directions for the study of the elements of anatomy, histology and physiology of the vertebrate body, and the first principles of bacteriology. Many of the instructions given are in interrogatory form, and for simple experiment and observation of the living in action, in which lies the very essence of the science of physiology, the student is commendably referred to his or her own body. Beyond this, however, there is nothing in the book that is new, or which calls for comment in these pages. The mode of treatment is begotten of a conviction on the part of the authoress, that "there is needed a radical change in the teaching of physiology"; and we read with astonishment the statement that while the method of teaching botany, chemistry and other sciences "has long been that of going first to the study of the specimen and then to the text-book," this has not been the case for "physiology"—that having apparently been taught from the text-book alone. She is writing, however, of State schools of America, and if the accusation be applicable to them generally, we wish her success in her enterprise.

Michigan Board of Agriculture. Annual Report 1898-99. Pp. 465. (Michigan: State Board of Agriculture, 1899.)

IN this volume are included the thirty-eighth annual report of the Secretary of the Michigan State Board of Agriculture, and the twelfth annual report of the Experimental Station of the State Agricultural College. Many subjects of interest are dealt with in both reports, but only a few can be referred to here. Experiments with Indian corn, to test the influence of thickness of planting upon the character of the crop, show that a gradual increase occurs in the yield of dry matter and protein as the distance between the rows and between individual plants is increased. It appears that, to obtain the greatest yield of valuable nutrients, Indian corn should be planted in rows fully three and a half feet apart, and the seeds six and nine inches apart in the rows. The establishment of several large beet-sugar factories in the State last year has caused increased attention to be given to experiments in beet culture. An interesting detail of some new experimental work, to which reference is made by Prof. C. D. Smith, director of the Experimental Station, is the breeding of bees with longer tongues. It is hoped that, by selection and breeding, a variety of honey bee will be developed capable of extracting nectar from the blossoms of the clover grown in the State.

Among the subjects of *Bulletins* published in the report are:—forestry, strawberry culture, methods of combating disease-producing germs and fruit-growing.